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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of QUARTARARO ET AL

Serial No. 09/297,737

Group Art Unit : 1764

Filed: 05/04/2001

Examiner: Nadine Norton

**For : CATALYST HAVING AT LEAST ONE ELEMENT OF GROUP VIIB AND
ITS USE HYDRO-TREATING**

DECLARATION UNDER 37 C.F.R. § 1.132

**Honorable Commissioner
of Patent and Trademarks
Washington, D.C. 20231**

Sir :

I, Germain Martino, duly warned, declare and say as follows:

THAT, I am a French citizen; that I graduated from "Faculté des Sciences de l'Université de Strasbourg" (France) in 1961; that I obtained an Engineer Diploma from "Ecole Nationale Supérieure de Pétrole et des Moteurs" Rueil-Malmaison (France) in 1963; that I was received as a Doctor by "Université de Louvain" (Belgium) in 1965; and that I now reside in 78300 Poissy (France), 80 avenue Fernand-Lefebvre;

THAT, I was hired by "Institut Français du Pétrole" Rueil-Malmaison (France) in their Research Department to research on catalytic agents and catalytic reactions in May 1967; that, from January 1985 to September 1989, I was Manager of the Kinetics and Catalysis Research Division; that, from September 1989 to December 1997, I was Assistant Manager of the whole Refining and Petrochemical Technology Business Unit; and that since then I have been Manager of said Refining and Petrochemical Technology Business Unit.

THAT, I am familiar with the hydro-treating processes and catalysts.

I declare further:

THAT, I have supervised the following examples :

Example 15

Supported [Ni+Mo+P] catalyst

This catalyst (named JQ9) is a **Ni-Mo-P** catalyst prepared by incipient wetness of the alumina carrier described in example 1. The NiMoP solution is prepared from a nickel nitrate, ammonium heptamolybdate and phosphoric acid solution (the metal content of the catalyst, calculated as the metal oxide, is respectively NiO 2,9 wt %, MoO₃ 15,5 wt % and P₂O₅ 5,8 wt %).

Example 16

Supported [Ni+Mo+Re] catalyst

This catalyst (named JQ10) is a **Ni-Mo-Re** catalyst prepared in two steps by incipient wetness of the alumina carrier described in example 1 of our invention. During a first step, we make deposit of the nickel and rhenium according to the example 5 of our invention. In a second step we add the molybdenum by a second incipient wetness of an ammonium heptamolybdate solution, according to example 6 of our invention (the metal content of the catalyst, calculated as the metal oxide, is respectively NiO 2,9 wt%, MoO₃ 4,1wt% and Re₂O₃ 12,8 wt%).

Example 17

Supported [Ni+Mo+Re+P] catalyst

This catalyst (named JQ11) is a **Ni-Mo-Re-P** catalyst prepared by incipient wetness of the JQ10 catalyst by a phosphoric acid solution followed by a drying at 120°C overnight and a calcination under dry air conditions at 500°C for 2 hours, the metal content of the catalyst, calculated as the metal oxide, is respectively NiO 2,7 wt%, MoO₃ 3.9 wt%, Re₂O₃ 12,3 wt%, and P₂O₅ 6,1 wt%.

Example 18

Comparative gas oil hydrodesulfurization test

We have performed a comparative test of diesel fuel hydrodesulfurization of the three catalysts described in examples 15, 16 and 17.

The test conditions of the three catalysts and the nature of the feed (sulfur level of 15700 ppmS) are well described in the example 14 of the specification of the instant application. Results are reported in Table 3. Results are expressed as relative activity considering catalyst JQ9 as base catalyst (relative volume activity of JQ9 equal to 1).

Table 3

Hydrodesulfurization activity of a straight run gas-oil for the three catalysts

Catalysts	Relative activity
JQ9	1
JQ10	1.17
JQ11	2.79

As can be seen, JQ9 and JQ10 have a similar activity, this points out the interest of using rhenium to promote the activity of the NiMo phase. When adding phosphorus to the NiMoRe catalyst, a surprising huge increase of the activity is noticed. To the man of the art, such an increase of activity by using phosphorus on a NiMo catalyst was not predictable. According to this result we only may assume that coexistence of rhenium and phosphorus on the surface of the NiMo catalyst has a strong effect on the nature of the mixed sulfide NiMo phase that is not comparable to the usual doping of a NiMo catalyst by phosphorus addition.

The undersigned declares further that all statements are made herein of his own knowledge are true and that all statements made on information and belief are believed to be true ; and further that these statements are made with the knowledge that willful false statements and the like so made were punishable by fine or imprisonment, or both under Section 1001 Title 18 of United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

A handwritten signature in cursive script, reading "Germain Martino". The signature is written in dark ink on a white background.

Germain MARTINO

Rueil, September 16, 2003